

Effect of Rosa damascene aromatherapy on sleep quality in cardiac patients: A randomized controlled trial



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A B S T R A C T

Keywords:

Nursing
Aromatherapy
Sleep quality
Coronary care unit

Objective: Sleep disorders are common among patients hospitalized in coronary care unit (CCU). This study aimed to investigate the effect of Rosa damascene aromatherapy on sleep quality of patients hospitalized in CCU.

Methods: In this randomized controlled trial, 60 patients who met the inclusion criteria were conveniently sampled and randomly allocated to the experimental and control groups. Patients in the control group received routine care. In the experimental group, patients received routine care and Rosa damascene aromatherapy for three subsequent nights. In the both groups the sleep quality was assessed using the Pittsburgh Sleep Quality Index.

Results: After the study, the mean scores of five domains of Pittsburgh Sleep Quality Index as well as the mean of total score of the index in the experimental group were significantly lower than the control group.

Conclusion: Rosa damascene aromatherapy can significantly improve the sleep quality of patients hospitalized in CCUs.

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1. Introduction

Sleep is a fundamental human need and also a determinant of health maintenance and recovery from diseases [1]. Most of hospitalized patients, particularly patients who are hospitalized in coronary care units (CCU), have some degrees of sleep disorders [2]. In CCUs, environmental factors such as noises, intervention-related pain and discomfort, psychological stress of having an acute disease, and disease complications may put patients at risk for developing sleep disorders [3,4]. Wenham and Pittard (2009) reported that in intensive care units, patients cannot sleep well and may stay awake for about 30–40% of their sleep time [2].

Sleep disorders can be associated with increased sympathetic activity and subsequent increased blood pressure and heart rate, raising the risk for developing cardiovascular problems among patients hospitalized in CCU [1]. Consequently, improving sleep quality in cardiac patients is a matter of great importance. Many strategies have been developed for improving sleep quality. For

example, sedative-hypnotic agents can increase the quality of sleep significantly. However, pharmacologic agents are usually associated with different side-effects [5]. Complementary therapies—including aromatherapy, muscle relaxation, and using eye mask and earplug—can also improve the sleep quality without causing serious side-effects [3,6,7].

Aromas can increase patients' calmness through affecting the limbic system [8]. However, research findings about the effectiveness of aromatherapy in improving sleep quality are conflicting. For example, Moeini et al. found that aromatherapy enhanced sleep quality among cardiac patients [3]. Chen et al. also found that valerian aromatherapy increased sleep duration and decreased insomnia among patients hospitalized in intensive care unit [9]. However, a systematic review revealed that lavender aromatherapy has no significant effect on sleep quality [10]. Williams also found that aromatherapy has no effect on sleep quality among children with autism [11].

Rosa damascene aroma is also used as a complementary therapy. According to Boskabady et al., Rosa damascene has hypnotic, sedative, and anticonvulsive effects on the central nervous system [12]. Studies have shown that Rosa damascene alleviates anxiety and promotes relaxation [13–15]. As anxiety negatively contributes to sleep quality [16], Rosa damascene aroma may also have

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potential effect on the quality of sleep among patients. However, to the best of our knowledge, this effect has not been examined yet. Accordingly, we conducted this study aiming at investigating the effect of Rosa damascene aromatherapy on sleep quality among patients hospitalized in CCU.

2. Methods

2.1. Design

This was a non-blind randomized controlled trial conducted in September–December 2013. The study setting included the two CCUs of a teaching hospital affiliated to Kashan University of Medical Sciences, Kashan, Iran.

2.2. Participants

The study population comprised all patients hospitalized in the study setting. The inclusion criteria were being oriented to time, place, and person, having a cardiac ejection fraction of at least 40%, having no known sleep-disturbing diseases (such as rheumatoid arthritis and migraine), having no known sleep disorders (as mentioned by participants), having no history of asthma, having no allergy to flowers, aromas, and herbal essences, having no history of orthopnea or nocturnal respiratory disorders and receiving no medical treatment during sleeping hours (22:00–06:00). The exclusion criteria included patient's reluctance to remain in the study, developing allergy to aromatherapy, developing orthopnea or any other nocturnal respiratory problems, decreased consciousness, cardiac arrest and using over-the-counter tranquilizers or hypnotic-sedative agents.

The study sample size was calculated using the results of a local study conducted by Daneshmandi et al. (2012). Based on the results of Daneshmandi et al. (2012), S_1 , S_2 , μ_1 , and μ_2 were respectively equal to 0.70, 0.40, 1.60, and 0.60. Accordingly, with a type I error probability of 0.05 and a power of 0.80, the sample size was determined to be fifteen patients for each group. However, for compensating probable attritions and achieving more reliable results, we recruited 30 patients for each group. Patients were recruited to the study by using the convenience sampling method.

2.3. Randomization

We randomly assigned the study participants to the study groups by using the permuted block randomization technique. Primarily, the six-block size of four was formed. Then, the sequence of blocks was determined using a table of random numbers. All the study interventions were implemented by the same researcher who was not blind to the study.

2.4. Outcome measures

The study instrument comprised two parts including a demographic questionnaire and the Pittsburgh Sleep Quality Index. The demographic questionnaire consisted of questions about participants' demographic and clinical data (including age, gender, marriage, employment, educational status, previous history of hospitalization, and medical diagnosis). The Pittsburgh Sleep Quality Index (PSQI) is a self-report questionnaire developed for evaluating sleep quality [17,18]. The PSQI consists of 7 components: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime dysfunction. The score for each component ranges from 0 to 3, resulting in a total PSQI score of 0–21. Higher scores represent lower sleep quality and vice versa [19–21]. In this study

we used Persian version of PSQI. Validation of the Persian version has yielded satisfactory results. Cronbach's alpha coefficient was 0.77 and corrected item-total correlations ranged from 0.30 to 0.75 for the seven component scores of the PSQI [17].

2.5. Intervention

At the start of the study (in the second day of hospitalization), we asked all the patients in both study groups to complete the PSQI. Moreover, we gathered patients' demographic and clinical data by referring to their medical records. The onset of intervention was in the second night of hospitalization. In the control group, patients received the sleep care routinely provided in the study setting. The routine sleep care included of reducing environmental noises, decreasing indoor lighting level, and providing nursing care during daytime to avoid interrupting patients' sleep for nighttime care provision. Patients in the experimental group received routine sleep care as well as aromatherapy. Each night, we applied three drops of Rosa damascene (Barijessence Co., Kashan, Iran) to a piece of paper towel and attached the towel to the side of each patient's pillow. The towel remained in place for eight hours (22:00–06:00). In the morning of the fourth day of the study (i.e. after the third aromatherapy session), we asked patients in both groups to fill out PSQI again.

2.6. Data analysis

Study data were analyzed by using the Statistical Package for Social Sciences (SPSS, v. 11.5). The matching of the study groups regarding demographic and clinical data was assessed by using the independent-samples t and the Chi-square tests. Moreover, we used the Kolmogorov–Smirnov test for testing the normality of the study main variable (the sleep quality scores). The results of this test revealed that the scores of PSQI and its domains did not have a normal distribution. Accordingly, we used the non-parametric Wilcoxon signed-rank and Mann–Whitney U tests respectively for within- and between-groups comparisons. The level of significance was set at below 0.05.

2.7. Ethical considerations

The Ethics Committee of Kashan University of Medical Sciences approved the study. Also, permissions were obtained from the hospital and the wards authorities. We informed the study participants about the aim and the course of the study, being free to participate in the study, being free to withdraw from the study at any stage, confidentiality of personal information and the lack of adverse effects of aromatherapy. Then we obtained a written informed consent from them.

3. Findings

Thirty patients were enrolled in each group (Fig. 1). The mean and standard deviation of participants' age in the experimental and the control groups were 61.40 ± 11.64 and 63.9 ± 10.23 years, respectively. Most of the participants were married (88.3%), literate (61.70%), and male (58.30%). The medical diagnosis for most participants was acute coronary syndrome (66.70%). Most of the participants (68.30%) had been previously hospitalized for at least one time. The statistical analysis showed no significant differences in age, gender, marriage, employment, educational status, previous history of hospitalization, and established medical diagnosis between the two groups (P value > 0.05 ; Table 1).

The Wilcoxon signed-rank test showed that in the experimental group, the mean scores of the sleep latency, the sleep duration, the

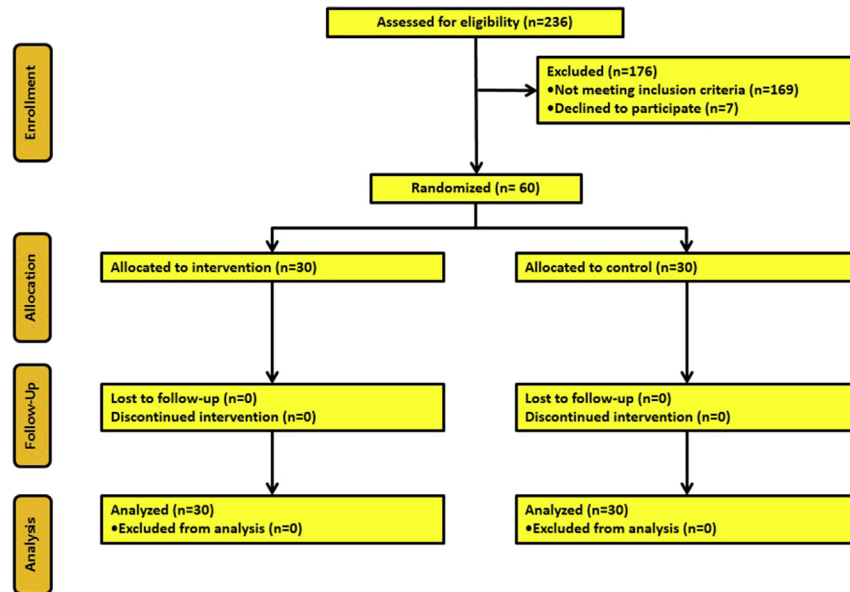


Fig. 1. Consort flow diagram.

habitual sleep efficiency, and the sleep disturbances domains as well as the mean score of total PSQI significantly decreased after the intervention ($P < 0.05$; Table 2). However, the mean scores of other PSQI domains (including subjective sleep quality, use of sleep medications, and daytime dysfunction) in the experimental group showed no significant change after the intervention ($P > 0.05$; Table 2). On the other hand, neither the scores of the domains nor the total score of PSQI changed significantly at the end of the study in the control group ($P > 0.05$; Table 2).

The results of the Mann–Whitney U test for between-groups comparison showed that before the study, there was no significant difference between the study groups in terms of the mean score of total PSQI as well as the mean scores of six (out of seven) domains of PSQI (P value > 0.05 ; Table 2). The only exception was related to the mean score of the daytime dysfunction domain which was significantly higher in the experimental group (P value = 0.004; Table 2). Results of the same test revealed that after the study, the mean scores of five domains of PSQI (including the subjective sleep quality, the sleep latency, the sleep duration, the habitual sleep efficiency, and the sleep disturbances domains) as well as the mean score of total PSQI in the experimental group were significantly lower than the control group (P value < 0.05 ; Table 2).

4. Discussion

This study investigated the effect of Rosa damascene aromatherapy on sleep quality among patients hospitalized in CCU. The findings revealed that Rosa damascene aromatherapy significantly improved the participants' sleep quality. This is in line with the findings of studies conducted by Chien et al. and Soden et al. [22,23]. Moreover, Lewith et al. found that aromatherapy significantly alleviated insomnia and improved the quality of life [24]. However, Williams et al. and Lytle et al. found that aromatherapy had no significant effect on sleep quality [11,25]. Williams and Lytle difference in results with the current study may be related to differences in sample size and duration of the intervention. In Williams's study the sample size was much smaller than the present study (12 vs. 60), also in duration of intervention in Lytle's study was smaller than the present study (1 vs. 3 night).

The present study found that Rosa damascene aromatherapy significantly reduced sleep latency and sleep disturbances and significantly improved the efficiency, the subjective quality, and the duration of sleep. Moreover, the study findings revealed that at start of the study, the mean score of the daytime dysfunction domain in the experimental group was significantly higher than the control group. However, after the study, the difference between the study groups in terms of daytime dysfunction was not significant. This finding implies that aromatherapy was also effective in alleviating daytime dysfunction in the experimental group. Chen et al. found that by exerting sedative-hypnotic effects, aromatherapy alleviated insomnia, decreased wake frequency, and increased sleep duration among patients hospitalized in intensive care unit [9]. However, Lee found that aromatherapy had no significant effect on postpartum sleep duration, wake frequency, and sleep satisfaction [26]. Chang et al. also found that aromatherapy was not effective in decreasing sleep latency and increasing sleep duration among nurses working at night shifts [27]. This contradiction is

Table 1
Patients' demographic characteristics.

Variable	Group		P value (Chi-square test)
	Experimental group [N (%)]	Control group [N (%)]	
Gender			
Female	14 (46.7)	21 (70)	0.067
Male	16 (53.3)	9 (30)	
Marital status			
Married	26 (86.7)	27 (90)	0.688
Single	4 (13.3)	3 (10)	
Education			
Literate	17 (56.7)	20 (66.7)	0.426
Illiterate	13 (43.3)	10 (33.3)	
Previous history of hospitalization			
No	10 (33.3)	9 (30)	0.593
One time	11 (36.7)	12 (40)	
More than one time	9 (30)	9 (30)	
Medical diagnosis			
Acute coronary syndrome	21 (70)	19 (63.3)	0.682
Dysrhythmia	2 (6.7)	4 (13.3)	
Congestive heart failure	7 (23.3)	7 (23.3)	

Table 2
Sleep quality in experimental and control groups.

PSQI domains	Groups	Before	After	P value ^a
Subjective sleep quality	Experimental	0.93 ± 0.69	0.66 ± 0.80	0.135
	Control	1.20 ± 0.71	1.13 ± 0.62	0.480
	P value ^b	0.114	0.012	
Sleep latency	Experimental	2.03 ± 1.15	1.03 ± 1.24	0.000
	Control	2.50 ± 0.97	2.60 ± 0.67	0.546
	P value ^b	0.068	0.000	
Sleep duration	Experimental	1.66 ± 1.34	1.03 ± 1.40	0.009
	Control	1.60 ± 1.00	1.73 ± 1.14	0.355
	P value ^b	0.679	0.042	
Habitual sleep efficiency	Experimental	1.40 ± 1.42	0.80 ± 1.29	0.023
	Control	1.76 ± 1.30	1.83 ± 1.34	0.804
	P value ^b	0.208	0.002	
Sleep disturbances	Experimental	1.00 ± 0.37	0.66 ± 0.60	0.004
	Control	0.96 ± 0.31	0.93 ± 0.36	0.564
	P value ^b	0.710	0.031	
Use of sleep medications	Experimental	1.00 ± 0.26	1.00 ± 0.37	1.000
	Control	0.96 ± 0.18	1.00 ± 0.00	0.317
	P value ^b	0.570	1.000	
Daytime dysfunction	Experimental	0.66 ± 0.80	0.43 ± 0.85	0.143
	Control	0.16 ± 0.37	0.10 ± 0.30	0.317
	P value ^b	0.004	0.081	
Total PSQI score	Experimental	8.70 ± 3.96	5.63 ± 5.13	0.001
	Control	9.16 ± 3.27	9.26 ± 3.00	0.408
	P value ^b	0.929	0.031	

^a The results of the Mann–Whitney *U* test for between-groups comparison.

^b The results of the Wilcoxon signed-rank test for within-groups comparison.

probably due to the discrepancies in the interventions of these studies. For example, Lee administered aromatherapy between 14:00 and 20:00, while we administered it during night—from 22:00 to 06:00. On the other hand, while we investigated the effect of aromatherapy on patients' nighttime sleep, Chang et al. focused on the effects of aromatherapy on nurses' daytime sleep.

The study findings showed that Rosa damascene aromatherapy had no significant effect on patients' use of sleep medications. Saeedi et al. noted that complementary therapies had no significant effect on patients' use of sleep medications [6]. Most patients in the intensive care unit of doctor's orders requiring medication are sleeping at night. In Iran most patients have confidence in their physician's instructions such as sleep medications and execute them [28]. Therefore do not start or discontinue drugs with their authorization.

This study has several limitations. Different people have different levels of psychological development and hence, have different abilities for coping with strains and pressures that disturb sleep. Moreover, different people have different sleeping habits. These two factors might have affected our findings.

5. Conclusion

The findings of this study indicate that Rosa damascene aromatherapy can significantly improve the sleep quality of cardiac patients hospitalized in CCU. Accordingly, healthcare providers can use Rosa damascene aroma—either in combination with current treatments or alternatively—for promoting patients' sleep without causing them the adverse side-effects of routine sleep medications. However, conducting further long-term, large-scale studies on cardiac patients as well as other patient populations is necessary for providing ample evidence regarding the effectiveness of Rosa damascene aromatherapy in promoting sleep. Moreover, comparing the effects of Rosa damascene aromatherapy with sleep medications on patients' sleep quality is also recommended.

Conflict of interest statement

The authors have no conflict of interest to declare.

Acknowledgment

This article is the report of a Master's thesis funded by Kashan University of Medical Sciences with the number 9276. The recorded code in the registration center of clinical trials is IRCT2013052013403N1. We would like to gratefully thank the Research Administration of the funding university as well as the administrators and the staffs of the study setting who helped and supported us during the study. We also are thankful of the patients for their participation in this study.

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